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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

LAVARIAS, ARNEL C

ART UNIT PAPER NUMBER

2872

DATE MAILED: 10/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Appli cation No.

09/779,125

Applicant(s)

SAKAI, MASUMI

Examiner

Arnel C. Lavarias

Art Unit

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-- The MAILING DATE of this communication app ars on the cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. ✓ The drawings are objected to because of the following informality:

Figure 5- All instances of "Rump" should read "Ramp".

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

✓ Page 1, line 28; page 4, line 4- "rump" should read "ramp"

✓ Page 4, line 27- "element," should read "element."

✓ Page 6, line 2- insert "(D)" after "differential"

✓ Page 9, line 10- delete "the" after "for"

✓ Page 12, line 17- "example but" should read "example,"

✓ Page 12, line 24- "so designed" should read "designed so".

Appropriate correction is required.

Claim Objections

3. Claim 3, 5, 7, and 10 are objected to because of the following informalities:

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✓ Claim 3, line 1- "3," should read "3.". Claim 10 is dependent on Claim 3, and thus inherits the deficiencies of Claim 3.

✓ Claim 5, line 1- "5," should read "5."

✓ Claim 7, line 2- "parallel" should read "proportional".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3-4, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Egan et al.

With regard to Claim 1, Egan et al. discloses a furnace-type atomic absorption spectrophotometer comprising a tube for heating a sample (See 2 in Figure 1; col. 3, lines 27-59), monitoring means for monitoring temperature of the tube (See upper portion of Figure 1, minus the DC-AC Converter and workhead; circuitry around 21, including 12, R₁, and 21 in Figure 5) and outputting a monitored value indicative of the monitored temperature (See 15 in Figure 5), heating control means (See lower portion of Figure 1, including the DC-AC Converter and workhead; Lower portion of Figure 5; Figure 6) for controlling heating current for heating the tube such that the monitored value will approach a specified target temperature value, and parameter setting means (See for

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example 7, 8, 9, 25, 'Ramp Rate' in Figure 5; col. 5, lines 5-17) for setting parameters which determine a response characteristic of the heating control means when the tube is heated by the heating control means.

With regard to Claim 3, Egan et al. discloses the parameter setting means including an input device for allowing a user to input parameters (See 7, 8, 9, 25, 'Ramp Rate' in Figure 5; col. 4, lines 5-40).

With regard to Claim 4, Egan et al. discloses the parameter setting means including an input device for allow a user to input a condition corresponding to the parameters (See 7, 8, 9, 25, 'Ramp Rate' in Figure 5; col. 4, lines 5-40).

With regard to Claim 8, Egan et al. discloses that the monitoring means monitors values indicative of the temperature of the tube (See 15 in Figure in Figure 5; col. 4, lines 52-68).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2, 5-7, and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Egan et al. in view of Schmider et al.

With regard to Claims 2, 5-7, and 9-10, Egan et al. discloses the invention as set forth above. Egan lacks the heating control means including a calculator for obtaining a

quantity of a specified operation of the heating control means by a PID control calculation on difference between said monitored value and said target temperature value and the parameter setting means to set at least one of the parameters for the PID control calculation. However, Pettit et al. teaches a self-tuning PID controller for applications such as plastic extruders and continually operable furnaces and ovens (See col. 13, lines 46-62). In particular, the PID controller is able to determine the appropriate PID tuning parameters, which include that standard proportional, integral, and differential parameters (See Abstract; col. 7, lines 12-25), and set the system to utilize these parameters (See col. 7, line 12-col. 8, line 61). Additionally, the self-tuning PID controller includes a microprocessor and non-volatile electrically alterable read-only memory (See col. 9, lines 33-55) to process and store the calculated parameters for later use. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the self-tuning PID controller, as taught by Pettit et al. in the furnace-type atomic absorption spectrophotometer as disclosed by Egan et al. One would have been motivated to do this to provide automated control of the determination of characteristic furnace parameters, as well as provide automated and self-tuning functions as the furnace characteristics change over time.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Egan et al. in view of Schmider et al. as applied to claim 2 above, and further in view of Clishem et al.

Egan et al. in view of Schmider et al. discloses the invention as set forth above in Claim 2. Egan et al. in view of Schmider et al. additionally discloses the use of silicon controlled rectifiers (SCR's) in the heating control for the tube (See 17 in Figure 5 of

Egan et al.; col. 4, lines 18-40). Egan et al. in view of Schmider et al. lacks the heating control means controlling the heating current by a phase control method and the quantity of a specified operation is a firing angle. However, Clishem et al. teaches that electrical furnaces can be temperature controlled using SCR's by controlling the firing angle (See Figure 6) of the SCR's, thus limiting the amount of current passing through the heating elements (See 80, 82 in Figure 5A and 5B; col. 4, line 26-col. 5, line 5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to control the firing angle of SCR's to adjust the amount of current provided to a furnace, as taught by Clishem et al., in the furnace-type atomic absorption spectrophotometer as disclosed by Egan et al. in view of Pettit et al. One would have been motivated to do this to take advantage of the higher reliability provided by SCR's since they have no mechanical parts that would likely fail.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 4225234 to Schmider et al.

Schmider et al. is being cited to evidence the typical state-of-the-art furnace-type atomic absorption spectrophotometer. In particular, this spectrophotometer includes a graphite tube (See 2 in Figure 1) and heating control and parameter setting means that are explicitly user accessible via a touchpad on the front panel (See Figures 3 and 4).

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However, the particulars of the heating control means, especially the determination and setting of PID parameters, are not disclosed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.

Arnel C. Lavarias
July 15, 2002



Cassandra Spyrou
Supervisory Patent Examiner
Technology Center 2800